



US005556284A

**United States Patent** [19][11] **Patent Number:** **5,556,284****Itou et al.**[45] **Date of Patent:** **Sep. 17, 1996**[54] **CHARGE COUPLING FOR ELECTRIC VEHICLE**[75] Inventors: **Hikaru Itou; Sho Miyazaki; Tsutomu Tanaka; Masashi Saito; Shinichi Yamada; Shigekazu Wakata; Eiji Saijo**, all of Yokkaichi, Japan[73] Assignee: **Sumitomo Wiring Systems, Ltd.**, Japan[21] Appl. No.: **446,453**[22] Filed: **May 22, 1995****Related U.S. Application Data**

[62] Division of Ser. No. 273,211, Jul. 11, 1994, Pat. No. 5,458,496.

**[30] Foreign Application Priority Data**

Jul. 12, 1993	[JP]	Japan	5-195443
Jul. 14, 1993	[JP]	Japan	5-197862
Jul. 15, 1993	[JP]	Japan	5-198957
Aug. 18, 1993	[JP]	Japan	5-226472
Aug. 20, 1993	[JP]	Japan	5-228038
Aug. 31, 1993	[JP]	Japan	5-240447
Sep. 20, 1993	[JP]	Japan	5-257650

[51] **Int. Cl.<sup>6</sup>** ..... **H01R 23/26**[52] **U.S. Cl.** ..... **439/34; 439/578; 180/65.1**[58] **Field of Search** ..... **439/34, 348, 35, 439/332-335, 578-580, 310; 180/65.1; 296/97.22****[56] References Cited****U.S. PATENT DOCUMENTS**

4,669,791	6/1987	Savill	439/34
5,350,312	9/1994	Kuno et al.	439/310
5,385,480	1/1995	Hoffman	439/310
5,401,174	3/1995	Hansen	439/34
5,417,579	5/1995	Yoshioka et al.	439/310
5,433,623	7/1995	Wakata et al.	439/310

*Primary Examiner*—Gary F. Paumen*Attorney, Agent, or Firm*—Jordan B. Bierman; Bierman and Muserlian**[57] ABSTRACT**

A charge coupling for an electric vehicle wherein conduction is enabled from a charger to an electric vehicle battery when a supply connector to the charger is completely fitted to a vehicle inlet installed in the electric vehicle. A locking member is provided for temporarily locking the supply connector to the vehicle inlet at a half fitting position, the locking device being further provided with a spiral groove extending from the half fitting position to the complete fitting position. An engagable boss which projects from a distal end of either the vehicle inlet or supply connector is adapted to detachably engage the spiral groove and the supply connector is provided, on its outer periphery, with a handle for assisting rotation of the supply connector so that the engagable boss moves within the spiral groove from an outer end to a terminating end. A holding member is provided on either the vehicle inlet or supply connector and serves to maintain the supply connector at the complete fitting position in the vehicle inlet when the engagable boss reaches the terminating end of the spiral groove.

**1 Claim, 28 Drawing Sheets**